

1. Please elaborate on the enclosure. Where are access doors relative to the table? What is the table height and therefore available volume and height for the beam delivery system? Relative to the enclosure, what beam height off of the table surface does the laser beam enter and where is the alternative experiment? Please be more specific.

The enclosure (made of clear Lucite) is 47"x 36"x 24" and is situated on a table in front of the excimer laser. The laser beam is parallel to the long dimension of the enclosure and enters in the middle of the 24x36" side (12" from the table top and 14" from the side). The table height (34 1/2") is not important since the system must be inside the enclosure. Since the system has to be inside the enclosure, the ablation system and beam delivery cannot be more than 23" tall (to fit in the 24" enclosure). There is an access door on the right side of the laser beam, if you face the same direction that the beam is traveling. The door is 42x17 inches and pretty much takes up the whole side of the table (on near side of enclosure in the photo). The alternative experiment only involves illumination through a photomask, so it does not have to be in a particular location.



2) The homogenizer effects the lens design and performance. Exactly what beam homogenizer is currently available? What is the working distance from the homogenizer to the mask? From what vendor and what are the optics comprising the homogenizer? I.e. lenslet size and radius other condenser and field lens

optics. Is the present imaging objective to be used? If so exactly what objective is it?

The source of the existing beam homogenizer, and thus the optics involved, is unknown. The homogenizer needs to be 2-12 inches from the mask. There is no imaging objective in the present system.

3) What is the maximum laser fluence on target specification? We assume 1 joule per square centimeter is acceptable. Is there a taper angle specification for the ablation features?

Prospective offerors are expected to know what is required for doing laser ablation in plastics. This would include knowing what fluences are required for doing laser ablation in plastics. If the taper angle is the angle of the focused laser beam, the angle will determine how small the ablated tunnels can be and still have parallel sides. NRL prefers 1-10 micron tunnels.

4) The substrate size (area) of 1" to 5" is understood. What is the substrate thickness or is this a cubic 1" to 5" part?

Substrate thickness can range from ½" to 5".

5) The mask is 3 X 3 inch square. Is this the open imaging area of the mask or the outside dimensions of the mask? What then is the maximum open area of the mask?

The photomask is an unrelated project. The mask features are irrelevant, except that we also need to conduct these experiments in the same enclosure. The 3x3" dimension is only an estimate of the amount of space these experiments will take up.

6) What is the FOV of the imaging lens?

There is no imaging lens.

7) As stated, the DXF translator is 3-D. Is it correct to assume the laser pulses will be the third dimension? Or will the part be a 3-D which will need to be positioned in space in addition to laser pulsing? Is the part a complex 3-D object or a flat substrate?

The part is a complex 3-D object. Laser pulses are not a dimension. The part will need to be positioned in space in addition to laser pulsing.

8) What total magnification does the through the lens imaging system need to be? What resolution is required of the vision system? If an existing lens is to be used is the optical prescription of this lens system available? What are the physical dimensions of this lens?

The imaging system needs to be able to view the results of the laser ablation, and so must have enough magnification to view the ablation feature sizes of less than 1 micron. There are no existing lenses. Offerors are expected to provide lens as part of their proposed laser ablation system.

THE DUE DATE FOR THE RECEIPT OF PROPOSALS REMAINS FEBRUARY 27, 2003 AT 4:00 P.M. ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.